

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 323900, CST 2:30p, 105/3

CAPCOM Apollo 8, Houston. We've switched and all the communications switch functions are operating normally Bill.

SC Okay, Mike, thank you.

SC Mike, the PRD readings for the CDR are
4 - that's .04, for the CMP is .64, and for the LMP is .25.

CAPCOM Good. I copy .04, .64, .25. Thank you.

SC Rog.

CAPCOM Go ahead, Apollo 8.

SC Oh, hi, Gene, how are you doing?

CAPCOM Roger. Fine. Over.

SC Is this Jerry.

CAPCOM This is him.

SC Listen, we show a TV count up here -
let's see - 31 20?

CAPCOM Affirmative.

SC We're about in the right position to try it again, and we wondered if you wanted us to take a trial run to see if it will work. Or do you just want to wait and try it when they're supposed to go on the air with it?

CAPCOM Okay. Stand by a minute.

SC Houston, Apollo 8. Over.

CAPCOM Go ahead, Apollo 8.

SC Roger. Could you ask the GNC to give us an update on our prop quantity, please?

CAPCOM Wilco. You're going to the RCS.

SC Roger.

SC If you'll get Jimmy kind of slow, I'll plot it.

CAPCOM All right, we'll come in, now.

CAPCOM Apollo 8, Houston.

SC Go ahead. This is Apollo 8.

CAPCOM Okay. In reference the early TV, we're loosing the high gain antenna now, and it looks like the only way we would have gotten the early TV pass in anyhow, was to send it to remote and try to look at it there. So we're going to scrub that idea. We'll just pick up with the signal TV. The (garble) remaining are the high-gain dependent type, and we'll put those off until the TV session is completed, and we'll work on the fuel propellant curve for you now.

SC Thank you.

CAPCOM Apollo 8, Houston. Okay, Apollo 8, What we're going to do on the TV is to go ahead and let you crank it up as soon as we get back on the high gain antenna, and it looks like - my guess is that this will be about 31:07, and we'll just use this to - while we have the coverage there. I have an update to your TLI plus 35 test. Now we

APOLLO 8 MISSION COMMENTARY,12/22/68,GET 313900,CST 2:30p,105/4

CAPCOM have to correct the (garble) on there.
So when you get that out let me know and I'll read it to
you.

SC Roger.

CAPCOM Okay. On the TLI plus 35 pass the update
I want to give you is the last three lines in the block.

END OF TAPE.

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 314900 CST 2:40p 106/1

SC Go ahead.

CAPCOM Okay. TLI plus 35 PAD the update I want to give you is the last 3 lines in the block. The EMS range to go 13084 35985 0984217, over.

SC Understand, reading 13084 35985 0984217.

CAPCOM That is affirmative.

CAPCOM Apollo 8, Houston. We are about to have a hand over to Goldstone, and our down link will be through then. I don't know if you will notice any difference in our uplink or not. Apollo 8, Houston. Apollo 8, Houston.

SC Go ahead Houston, you are loud and clear.

CAPCOM Okay. We have switched sites over to Goldstone now. I don't know if you can tell any difference in our uplink. Okay, you have cleared up quite a bit. It sounds a lot better to us.

SC Okay.

CAPCOM Apollo 8, Houston.

SC Go ahead Houston, Apollo 8.

CAPCOM Okay. I have some RCS quantity data for you. We are all set up to receive the TV whenever you get high-gain looking at us.

SC Okay. Let me get turned around here.

Go ahead with the quads propellant quantities please.

CAPCOM Okay, Apollo 8. alpha minus 225 pounds 74 percent bravo 240

SC Slower please.

CAPCOM Roger. I will repeat. alpha 225 74 percent, bravo 240 pounds 79 percent, charlie 236 - 78 percent, delta 238 - 79 percent, I would like to remind you on the TV that we need narrow beam width when you get up in high gain. Over.

SC Roger. Understand. Houston, how do you read Apollo 8?

CAPCOM Loud and clear, Apollo 8.

SC Okay. Thank you.

CAPCOM Apollo 8, Houston. Okay. I have a few items for you here I would like to clear up and then leave you alone for a while. The first thing is we would like for you to confirm that your spot meter had an ASA setting of 100.

SC That is confirmed.

CAPCOM Okay. Thank you. That was one of the first questions that came to mind. we are ready for a trial fan cycle at any time. Use your normal procedures.

SC Okay.

CAPCOM All right. You can anticipate a fuel cell purge at 35 hours. We ought to be through with battery A charging somewhere after 34 hours. Looks like you will

CAPCOM have just about a full battery there. We will give you a call on the exact time to cut it off. We would like to get some confirmation from you on the chlorine procedures. Did you get some in last night or not? Just a quick summary of how much sleep you got on Lovell and Anders?

SC Okay. We got the chlorine in and the water has been chlorinated and just a minute I will check with them on their sleep.

CAPCOM I am sorry I didn't copy that sleep.

SC Say again, Ken.

CAPCOM I am sorry I didn't copy your last, Frank.

SC I was asking you to say - say what you said. Jim had about 4 hours sleep, and Bill had about 3 hours sleep.

CAPCOM Okay. Thank you very much.

SC We feel pretty good today. We would like to see in looking over the flight plan, perhaps we ought to put the rest periods a little bit shorter and more frequent. It seems it might work out better. We got all out of kilter on it yesterday. We are sort of trying to get back in a normal cycle.

CAPCOM Okay. We will look into that.

SC You all are doing good work. Keep it up.

CAPCOM Okay. Thank you. Looks like the only other thing we have left over is a COMM check and if we can work that in without interrupting your present schedule we would like to.

SC Okay. Right now we are stopping for a break, but we will go ahead and do that. What does it involve?

CAPCOM Okay. We will need the high-gain antenna, and there should be no comm loss during this mode.

SC Okay, Ken. I think we are going to lose the high gain here shortly. Why don't we pick it up next time it comes around?

CAPCOM Real fine.

SC Remember, the most important part of the trip occurs in two days when we start back. So you all get better rested too.

CAPCOM Will do that.

CAPCOM Affirmative, Apollo 8.

PAO That brings us up to date with the communications with the spacecraft at present. At this time it is quiet. We have had no further communications with the crew. We expect that it will remain quiet for the next hour or two. At the present time, Apollo 8 is at an altitude of 123 768 nautical miles, and our current velocity reading here at Mission Control is 4568 feet per second. I believe

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 314900 CST 2:40p 106/3

PAO this is in conflict with a figure given earlier on the velocity in our previous announcement. I recall is being reported at about 4400 feet per second. I would like to point that the spacecraft is continuing to decelerate and the reference to 4400 feet per second in a previous announcement would be incorrect. The current read-as I said 4568 feet per second on the velocity. At 31 hours 57 minutes into the mission this is Apollo Control.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 320800 CST 2:59p 107/1

SC Good by from Apollo 8

CAPCOM Thank you.

SC I hope we can get that other lens fixed. Or some reading on it.

CAPCOM Roger. We are going to work on that one. The one that is sensitive to light is lens that you were just using. You want to be careful about pointing that at some bright object.

SC Roger. We are starting PPC again. I believe that lens hasn't been used for quite awhile, Ken.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 321900, CST 3:15 108/1

PAO This is Apollo Control at 32 hours 14 minutes into the flight now. Apollo 8 is currently at an altitude of 124 506 nautical miles, traveling at a speed of 40 546 feet per second. And we are in touch with the spacecraft at this time. We'll pick up communication and follow it along as it develops.

SC Communication check.

CAPCOM Okay, standing by. Apollo 8, Houston.
Apollo 8, Houston.

SC Go ahead Houston, Apollo 8.

CAPCOM Okay Apollo 8, looks like we're going to have to put this com test off because of some tracking requirements. We can do it in about an hour if this will not interfere with your present operations too much. It'll take maybe 15 to 20 minutes, and it will involve some conversation on the part of the people onboard the spacecraft. So if that's going to interfere with your sleeping and all, why go ahead and we'll defer to that and we'll pick these requirements up some other time. Heh, I've got a score here, looks like Baltimore 21 to nothing.

SC Who were they playing?

CAPCOM How about Minnesota.

SC That's from that other league. How did last year's Army - Navy game come out?

PAO This is Apollo Control, we don't appear to have anymore conversation developing with the spacecraft. Check with the Flight Dynamics Officer down here in Mission Control Center indicate that the spacecraft will continue to decelerate until about 55 hours 38 minutes ground elapse time. At that point our estimate is that it will come into the Moon's sphere of influence or perhaps more accurately the Moon's gravitational attraction will become the dominant force acting on the spacecraft, and the spacecraft will begin to accelerate again. At this point it's altitude will be about 176 thousand nautical miles. It will be about 30 thousand nautical miles from the Moon. At 32 hours 20 minutes into the flight this is Apollo Control.

END OF TAPE

APOLLO 8 MISSION COMMENTARY,12/22/68,GET 322800,CST 3:20p,109/1

PAO This is Apollo Control at 32 hour 48 minutes. Now we're in communication with the spacecraft at this time, and we'll bring you up to date with a tape recording on the earlier part of the conversation and then pick it up live.

CAPCOM Go ahead, Apollo 8.

SC Roger. We've turned up all the cryos. Could you give me your quantities, please?

CAPCOM Okay. Stand by.

SC We advised the CMP.

CAPCOM Okay. And our guys down here are watching high gain antenna pointing program, so anytime you're not using the DUSKY fan in alpha, they'd like to watch it for a couple of cycles, so if you would leave that noun 51 on the display it will help a lot down here.

SC Okay. Why don't you give us react angles and we'll try that for the next time.

CAPCOM Okay.

CAPCOM Apollo 8, are you ready to copy from ground quantities?

SC I'm ready. How about 02 first.

CAPCOM Okay. 02 tank 1, I show 88.1 percent.

SC Okay. Could you give it to me in pounds, please?

CAPCOM Okay. You'll have to stand by while we convert that.

SC That's okay, Gene, go ahead, I'll take the percent.

CAPCOM Okay. We will try and get the pounds for you, too, though. Tank 1 oxygen 88.1.

SC What time is that for?

CAPCOM This is present.

SC 32:30, okay.

CAPCOM Okay, I've got 32:25. And 02 - okay, 02 tank 1, 88.1, 02 tank 2, 87.37,

SC Is that .37 or .36?

CAPCOM .37.

SC Roger, got it.

CAPCOM H2 tank 1, 75. niner 7. Tank 2, 78.06. Over.

SC Okay, thank you very much. It looks good.

CAPCOM Okay, thank you.

END OF TAPE.

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 324500, CST 3:40 110/1

PAO This is Apollo Control at 40 rather 32 hours 45 minutes. At the present time the spacecraft is at an altitude of 125 723 nautical miles, traveling at a speed now of 459 feet per second. We've been in conversation with the crew for the last couple of minutes. At the present time lunar module pilot, Bill Anders and command module pilot Jim Lovell are attempting to get a little bit of sleep. Anders requested a few moments ago that he be given a go ahead to take a Seconal tablet. This is one of the short acting sleeping pills carried aboard the spacecraft. And the medics have given him the go ahead to take the Seconal tablet. We'll play back that tape for you now and then stand by for further conversation with the crew.

SC Go ahead, Houston, Apollo 8.

CAPCOM Okay, just a couple of things I need from you. I would like to get a battery C voltage. I would like to check a battery manifold pressure.

SC Battery C 37 volts.

CAPCOM Understand 37 volts on battery C, is that affirm?

SC 37.

CAPCOM Okay, thank you. And if you can give the battery manifold pressure, like to read that one.

SC Point 6 volts.

CAPCOM All right understand point 6 volts. The angle you asked for on the high-gain antenna are pitch minus 45, and yaw 90.

SC Okay, this is Apollo 8, I'm just going to go to high-gain antenna, we're about ready to pick you up on the beam that works on react.

CAPCOM Okay, and I have a scanning telescope star visibility item for you to pick up when you're ready to copy that.

SC Roger, we'll get that on high-gain when we get back to you.

CAPCOM Okay, thank you.

SC We'll come back on high gain.

CAPCOM Roger.

SC That's not fair, we're there already.

CAPCOM That's pretty good acrovision.

SC You guys are reading the disk. Go ahead Houston.

CAPCOM Okay, Apollo 8, believe we ought to try that one again next time. And the scanning telescope star visibility is scheduled for a 34 10 in the flight plan. And it'll be star number 31. The angles are roll 184.7, pitch 23.4, yaw 14.3, shaft and trunion zero, over.

SC Star 31, roll 184.7, pitch 23.4, yaw 14.3,

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 324500, CST 3:40 110/2

and start at shaft and trunion at zero.

CAPCOM That's affirm, and that's copy star 31.

SC That's roger, 31.

CAPCOM Okay, thank you.

SC Houston, Apollo 8.

CAPCOM Go ahead.

SC LMP would like to take a Second and hit the hay.

CAPCOM Okay, that's a go.

SC Okay, thank you.

CAPCOM Telemetry data to data.

SC Normal mode voice to voice; telemetry data to data.

CAPCOM Okay, up telemetry command to normal.

SC Normal.

CAPCOM High-gain antenna track auto.

SC Roger, on auto.

CAPCOM High-gain antenna beam width to narrow.

SC Beam width narrow.

CAPCOM Okay, this will be our base line data check. This will be a full uplink voice with ranging and fold down link.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 331300 CST 4:05p 111/1

PAO This is Apollo Control at 33 hours
13 minutes. At the present time we are involved in a series
of communications checks with the spacecraft. We will pick
that up for you at the beginning and continue to monitor
live.

CAPCOM Apollo 8, Houston. We are going to have
to delay the COMM check again.

SC Houston, Apollo 8. How do you read?

CAPCOM Apollo 8, Houston. You call?

SC Roger. We lost you for a while there.

Are you reading us there now?

CAPCOM Loud and clear now.

SC Okay. Thank you, so are we.

CAPCOM Okay, Apollo 8, do you want to try that
AUTO REACT 33 plus 24 looks like a good time and the angles
are the same. And the late ball scores are 24 to 14 --

SC (Inaudible)

CAPCOM All right.

SC Say again.

CAPCOM I say a late ball score here is --

SC Do you have the ball scores?

CAPCOM 24 to 14.

SC Baltimore over Vikings?

CAPCOM Affirm.

SC Houston, Apollo 8.

CAPCOM Go ahead, Apollo 8.

SC We have reached the scan limit on the
high gain, what do you want us to do about it now?

CAPCOM Apollo 8, what we would like to do with
these angles is set it in AUTO REACT over on panel 2, and
it is under the tracking for the high-gain antenna, and it
will -- the lower position will say REACT. On the position
dials we would like to set pitch to minus 45 and the yaw to
90.

SC Pitch minus 45, yaw 90.

CAPCOM Okay. Stand by 1.

SC Roger. We could leave it in REACT if
you want to use the high gain to keep from waking us up
every rev.

CAPCOM Apollo 8, Houston. I think we may have
gotten off on a tangent. These are pitch and yaw angles
that we called up to you for the high-gain antenna were
in response to Bill's request to know what position we could
put on there for a -- for the AUTO REACT position. We can
straight -- still remains if we don't want to be on an omni
antenna at the same time. We are in the AUTO REACT position
we should be in one or the other. So, you can use that
information if you want to try it out. Otherwise the procedure
he has been using all along will be just fine. Over.

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 331300 CST 4:05p 111/2

CAPCOM Apollo 8, Houston. I am transmitting
in the blind right now. Our downlink isn't working, so --
PAO This is Apollo Control at 33 hours
17 minutes. At the present time the spacecraft is at an
altitude of 126 969 nautical miles from Earth traveling at
a speed of 4471 feet per second. We have no further
communication with the crew at this time. We will take
circuit down and stand by to come up again when next we are
in touch with the spacecraft. This is Apollo Control at
33 hours 18 minutes.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 333800, CST 4:30P, 112/1

PAO This is Apollo Control at 33 hours 38 minutes. Spacecraft, at this time, is 128,179 nautical miles from Earth and our velocity is 4434 feet per second. We're still involved from time to time with the communications checks with the spacecraft. One of those is in progress at this time and we'll pick up the beginning and continue to follow along.

SC Houston, do you read Apollo 8?
CAP COM Right, Apollo 8. Read you weak but clear now.

SC Roger, Thank you.
CAP COM Okay, looks like we had a ground problem there.

SC Roger.
CAP COM Apollo 8, Houston.
SC Go ahead.
CAP COM Okay, looks like we're at a good attitude to try this high gain antenna on the COM check one more time. I believe you're still on an omni. Is that correct?

SC Roger.
CAP COM Okay, if we could try the high gain and maybe we can get started on this COM check. I'd also like to verify that you've got the LMP and the CMP trying to get some sleep here and we could use an oral temp from you too.

SC All right, my temperature is 97.5.
CAP COM Okay, thank you.
SC That's what it was this morning when I felt badly.

CAP COM All right, thank you.
SC Do you want me to go to omni now, Ken?
CAP COM I'd like for you to go to high gain.
SC High gain?
CAP COM Yes sir.

SC High gain.
SC This is Apollo 8 on high gain.
CAP COM Rog. You're kind of weak now but we're taking a look at it.

SC Houston, Apollo 8 on high gain.
CAP COM Okay, I'm reading you loud with just a little background noise.

CAP COM Apollo 8, Houston. We're not getting a good lock. Wonder if we could try making sure that we're in AUTO on the tracks and that we're now beam width?

SC Stand by. How's that, Houston?

CAP COM Okay. That works real good.

CAP COM Apollo 8, this is Houston. What we're doing right now is sending dateline data and we'll be in the

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 333800, CST 4:30P, 112/2

SC . . . mode for another couple of minutes
and then we'll be moving out to a conditional..

CAP COM Apollo 8, Houston. How do you read?

CAP COM Apollo 8, Houston.

SC Houston, Apollo 8, read you five by.

CAP COM Okay, we are receiving some ground
problems and we're reading you weak but clear. We're ready
to start into our test. We're going to be changing our
mode so you'll probably hear a burst of noise as we make the
change. This will be a noise that sounds like an S-band
armlock. However, your AEC leader will lock out. This is
due to the modulation of the uplink. There will be about
2 minutes and during this time, you will hear one burst of
noise.

CAP COM Apollo 8, Houston. Voice check. Over.

CAP COM Apollo 8, Houston. Ready to check.

CAP COM Apollo 8, Houston.

CAP COM Apollo 8, Houston.

SC Go ahead, Houston.

CAP COM Apollo 8, this is Houston. Do you read?

SC That's affirmative.

CAP COM Okay, thank you. Were you reading all
along? This is the first time we've heard you call back.

SC Houston, we're reading you but we're
trying to hold the noise down so we can get some sleep.

CAP COM We'll be through with this in just a
minute, I think.

SC Roger. I will answer you but I'll try
to do it quietly.

CAP COM Okay, Bill.

CAP COM Okay, Apollo 8, next portion of the test
is like we did yesterday. We'll be changing the uplink mode
to uplink command and ranging with no upvoice. We'll be in
this mode for approximately 2 and 1/2 minutes and send two
test messages. During this time, we will not have uplink.
We are going into this mode at time 33:48:30 and we'll be
back in this configuration at 33:50:00. Over.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 334800, CST 4:40 113/1

CAPCOM At time 33 48 30, and we'll be back in this configuration at 33 50, over.

CAPCOM Apollo 8, Houston, are you clear?

SC Clear Houston.

CAPCOM Okay, fine. How about telemetry input PCM switch to low please?

SC You're in low, Houston.

CAPCOM Roger. Apollo 8, we've completed third test; we're going into the final test now. PCM switch to high please. Apollo 8, Houston, we're going to switch uplink to the upvoice backup for about 2 minutes, and may take a few seconds to link the transition. And we'll be back up at 33 56 in our normal mode to place the up telemetry data switch to upvoice backup at this time, over.

SC Roger.

CAPCOM Apollo 8, Houston on backup voice.

SC Loud and clear, Houston.

CAPCOM Okay, fine, thank you. Apollo 8, we're still back up to telemetry data switch to data. Apollo 8, Houston. Apollo 8, Houston. Stand by, guess we've got 85 foot site voice back now, the noise went away. Apollo 8, Houston.

SC Go ahead, Houston.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 335900 CST 4:51p 114/1

SC Go ahead, Houston.

CAPCOM Okay. Apollo 8 that completes our COMM test. Thanks for your cooperation. I have a change here to a map sighting that will come up 3420. We want to change your star a little bit there. Are you ready to copy?

SC Ready to copy.

CAPCOM Okay Apollo 8. We would like to change and have sighting as follows: we would like to use star 26, that is 2 6, we would like to make it Earth-near horizon for 2 sets, 2 sets. Then we would like to take star 16 Earth far horizon 1 set. If star 26 near Earth horizon is not possible, star 16 Earth far horizon 1 set, and star 22 Earth far horizon, 1 set. Over.

SC Roger, Houston. Be advised the CMP is asleep and whatever you better put those off for awhile.

CAPCOM Okay. Stand by. Apollo 8. We can put this off. What we will probably need from you is some kind of an estimate of when you think somebody will be available to work on it, and we are working on how much lead time we need now.

SC Stand by 1. Houston, why don't you figure the CMP will sleep another couple of hours, then the LMP and then the CDR up to about 43 hours. Over.

CAPCOM Okay.

SC Then we will start off with the CMP again in about 44.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston.

CAPCOM Okay. We can put off this map sighting. It was scheduled apparently for 420. We can put it off. Judging from your comments about sleeping, we would like to get to it as soon as we can. Right now our plans are to sight at 2 hours. We will do the P-52 by sighting it back to the same thing since it is associated with the P-23. So if that is a convenient time for you why we will plan on that.

SC We are doing the P-52 now. Do you want us to continue?

CAPCOM Well, as far as we are concerned that isn't going to help us any. We will have to do it over again anyhow.

SC Okay. What time did you want to do it?

CAPCOM Well, if you think that Jim is going to be up in a couple of hours why that will fly us two hours to 3620.

SC Okay. We will go ahead and make another one there and pick it up there.

CAPCOM Okay. That will be real fine. Thank you.

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 335900 CST 4:51p 114/2

SC What we are going to try to do is get
back on the sleep cycle to those sleep periods just prior
to LOI by taking shorter cycles for each man.

CAPCOM Real fine.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 340900 CST 5:01p 115/1

PAO This is Apollo Control at 34 hours 10 minutes. As you heard in that conversation with commander Frank Borman we will be rescheduling part of the flight plan activity in order to allow Jim Lovell to continue sleeping. That is the mid-course activity scheduled to occur between 34 and 35 hours in the flight plan. Current plans are to move that back about 2 hours. Do it after Lovell has had a chance to get some rest. Borman also advised that following Lovell's sleep period, Anders would attempt to get a few hours of rest. That he himself would try and get some rest. At 34 hours 11 minutes into the flight this is Apollo Control.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 342300, CST 5:15p, 116/1

PAO This is Apollo Control at 34 hours 23 minutes. And the past few minutes we've been in conversation with the spacecraft. Frank Borman and Lunar Module Pilot Bill Anders and Bill advised that he was preparing to join Jim Lovell in getting a little bit of sleep, and Frank Borman advised that when one of the two wakes up a little later on, he'll try and get a few hours of rest, also. We'll play back the tape with that conversation and then continue to follow on any conversation live.

SC Houston, Apollo 8.

CAPCOM Apollo 8, go ahead.

SC How about giving us some react angles and we'll stay in react.

CAPCOM Say it again please.

SC Okay. Give us some react angles.

CAPCOM Wilco.

SC Say it again.

CAPCOM Apollo 8, Houston. I hadn't said anything at that time. We're digging some angles out for you now. In reference to your earlier question about the sleep cycle juggling et cetera, we agree with your comment. We would like to get back on the flight plan as far as the sleep cycles and so forth are concerned by the time we get into lunar orbit. So we'd like for you to use your own judgment about the most efficient way to accommodate the sleep cycles and proportion it up among yourselves. We would like to have you keep us informed about who's doing what and what your plans are. We have the 1P23 that we slipped 2 hours. We'd like to get the other one in. We can also adjust the time for the other P23 if it's going to conflict - I guess that's two more P23's. We can adjust the time for those if you'll let us know what your forecast is for when Jim will be available to take some sightings. So the big message is that we'd like to work around whatever your desires are. If you'll let us know, we'll pick some stars and some angles and have them ready for you.

SC Okay, Houston. The CMP will be up at 36:36 hours. The LMP is going to sleep now, and he'll sleep through until 40 and then I'll stagger that in and try to go to sleep around 30 to 37 so that by the time we get to day 3 we'll all be back on the same direct sleep cycle.

CAPCOM Okay, real fine. Thank you.

CAPCOM Apollo 8, Houston. React angles look like minus 45 in Pitch, plus 90 in Yaw, and 34 23 for the time.

SC Roger. Copy. This is good users react because it keeps the caution warning from going on.

CAPCOM Rog. I understand that. Are you leaving the high-gain antenna on after it swings over to the recut

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 342300, CST 5:15p, 116/2

CAPCOM position?
SC Do you have any reason for us to use the
high gain antenna?
SC Do you think we need that, really, very
much?
CAPCOM Stand by.
SC Why can we just not use the high gain
antenna for awhile? Getting high bit rate on the omni's
Okay, let's tell them then that we'll just not worry about
the omni for awhile. (Garble)
SC Houston, this is the LMP. Before I hit
the sack, could you give me a rundown on our systems the way
you see them?
CAPCOM Okay, we'll put that together for you
and we were just talking about the redundant ECS components
check and we were going to put that off until everybody's had
a chance to get some sleep. Trying to keep these men from
going to the left hand couch.
SC Oh, that would be nice. I sent Lovell
onto the couch, though. I've got one man sleeping under the
left couch here - right couch and one man sleeping on our
right couch.
CAPCOM Okay. I understand you've got one under
and one on the right couch.
SC Roger, that's affirmed.
CAPCOM Okay, and in reference to the omni versus
the high gain, it looks like we can live with the omni antennas
here for several more hours, if you would like to delete the
use of the high gain.
SC Okay. Good doing Houston.
CAPCOM Okay before you pitch your eyeballs there, we'd
like to terminate the battery charge.
SC I knew you guys would get me.
CAPCOM Got you.
SC Okay the battery charge is terminated at
37.3 volts.
CAPCOM Okay, thank you.
SC Standing by for your systems
status.
CAPCOM Okay, we'll pulling that together now.
SC How are the PU valve and SPS 9/10ths
looking?
CAPCOM Okay, I'll test that.
SC We just had (garble) I understand.
SC Systems look okay, Houston?
CAPCOM Okay, Apollo 8. All the systems look
real fine. You've got an RCS quad update on the quantity,
so you have that information. The SPS oxidizer feed line
temperature and the fuel temperature are both at 73 degrees.

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 342800, CST 5:15p, 116/3

CAPCOM The cryo profile is running right on the line. Battery A - our calculation have 39.63 amp hours, Battery B, 37.94, and Battery Charlie, 38.46. The comm continues to be running ahead of predictions in quality and circuit margins. Everything else looks like it's real fine.

SC Rog. Do you expect to have a low bit rate voice on the PMC of the omni's at Lunar distances?

CAPCOM That's negative on PMC of the omni's. Not looking forward to very much improvement.

SC Roger. We need about a 30-foot dish I figure, for that.

SC On the spacecraft.

CAPCOM It runs up the fuel required for PPC, though, Bill.

SC Rog.

PAO This is Apollo Control. There are no further communications with the spacecraft at this point, so we'll take the circuit down and stand by. At the present time, Apollo 8 is at an altitude of 130 368 nautical miles, and velocity is 4370 feet per second. This is Apollo Control at 34 hours 33 minutes into the mission.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 345700, CST 5:47 117/1

PAO This is Apollo Control at Houston at 34 hours 57 minutes into the flight of Apollo 8. Here in Mission Control Center, Flight Director Milton Windler has just held what he termed a midshift briefing bringing all the flight controllers here in the center up to date on the latest developments as they stand in respect to the overall performance of the spacecraft and the status of the crew. In general, Flight Director Windler noted that the crew feels much better and they have been advised to set their own pace as you probably heard in the air-to-ground commentary between the ground and the crew. Lovell is currently sleeping, and he went to sleep at about 34 hours and plans to sleep through until about 36 hours g.e.t. Bill Anders went to sleep about 20 minutes later, and we expect that he will be sleeping till about 40 hours ground elapse time. Frank Borman advised that he would like to try to get some sleep at about 37 hours ground elapse time about 2 hours from now. And we expect that he will probably sleep 4 or 5 hours. All of the spacecraft systems look good at this time. We've also got a preliminary evaluation of the onboard TV performance this afternoon. And perhaps an explanation on the problems the crew experienced with the telephoto lens. The feeling at this time is that perhaps the automatic light control device on the camera was in effect fooled by the bright disk of the Earth in the dark background overcompensating and washing out the picture. We're running some tests to determine if this information was in fact was the case and it maybe possible to correct this on future TV transmission with the use of proper filters. We do have a bit of brief communication with the spacecraft, with Frank Borman, and we'll play that back for you now and then stand by for any live conversations that develop in the meantime.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston, Apollo 8.

CAPCOM Okay, I know you're trying to be quiet so I'll just read up some information to you. One of the things that we just turned up that might give you some confidence, you lose oxygen cryo tank now. You have 80 pounds remaining now at CMSM sub. The limiting factor on single tank operation right now is the hydrogen tank which has a positive margin at CMSM sub, assuming our standard profile gives about 143 hours. So it looks like you over the hill on those. Notice that your flying in the rate 2 position for your B mags which is fine. Only make sure that you still were maintaining a PTC attitude. Looks like your pretty close to it.

SC Roger, we are flying PTC, and I was wondering why it was going out of the deadband, now I know, thank you.

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 345700, CST 5:47 117/2

CAPCOM Okay, thank you.

SC That's what happens when you let Anders fly. He's asleep so he can't defend himself.

CAPCOM Roger, but we've got it on tape though.

SC Good. They're both conked out, how about just filling me in on some news, and I'll keep quiet just to give me some words on what's going on in the world.

CAPCOM Okay, give me a few minutes to collect some data, and we'll do that.

SC Houston, Apollo 8, how do you read?

CAPCOM Loud and clear, Apollo 8. Hadn't forgotten you just -

PAO This is Apollo Control, we'll continue to stand by for any conversation with Frank Borman aboard the spacecraft. In the meantime, we would also like to perhaps clarify some figures we gave earlier concerning the point at which the spacecraft comes under the dominant influence of the Moon gravity and begins accelerating toward the Moon. Now that figure we gave you was a time of ground elapse time of 55 hours 38 minutes. At that point the spacecraft velocity, this is inertial velocity, the - with respect to the Earth - is about 3261 feet per second. And this occurs at an attitude from the Earth of 176 271 nautical miles. At this point, the point at which the spacecraft passes into the lunar sphere of influence, gravitational influence, here in Mission Control Center will shift our reference point for measuring spacecraft velocity and will no longer be measuring it with respect to the earth, but will begin measuring it with respect to the Moon. At this point 55 hours 38 minutes ground elapse time, the Earth reference velocity will be 3261 feet per second, and by comparison in reference to the moon it will be 3980 feet per second. To give you some indication of what continues to happen to the velocity then as we progress toward the Moon, the speed of the spacecraft with respect to the Earth will reach a minimum point some 65 hours into the flight when we're about 11 000 nautical miles above the Moon. At this point, the velocity will be 3 083 feet per second with respect to the Earth; with respect to the Moon, and this will be the figure that we'll be using in Mission Control Center, the velocity at that point 65 hours into the flight or 11 000 nautical miles from the Moon, the spacecraft velocity is projected to be about 4353 feet per second, 4350, and it will accelerate rapidly from that point for the next 4 hours until we reach the point of lunar orbit insertion. That nominally is set to occur at this time at about 69 hours 11 minutes. And for that 4 hour period of time, the velocity will increase from 4350 feet per second to about 8420 feet per second. And

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 345700, CST 5:47 117/3

then as we go into orbit about the Moon, that will reduce the velocity by slightly under 3000 feet per second taking it down to about 5300 feet per second. Coming back again the same thing will apply in reverse. We'll follow the spacecraft velocity with respect to the Moon until the Earth becomes the dominant force, gravitational force acting upon the spacecraft. And then at that point we will transfer back to an Earth reference system. At the present time Apollo 8 is at an altitude of 131 843 nautical miles, and we're traveling at a velocity of 4327 feet per second. At 35 hours 5 minutes into the flight, this is Apollo Control.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/22/68, GET 352200 CST 6:13 118/1

PAO This is Apollo Control Houston at 35 hours 22 minutes into the flight. At the present time Apollo 8 is 132 542 nautical miles from Earth, and our velocity is 4307 feet per second. At this time here in Mission Control Center we are working on a minor communications problems. We seem to have trouble getting the communications from the Control Center to Hawaii. We are reading the spacecraft loud and clear. No problem with communication across the 132 000 some odd miles between the spacecraft and Earth. The problem appears to be between Houston and Hawaii. Hawaii has been in touch with Frank Borman on the spacecraft and advised him that we are working on the problem at the present time and that we, as I said, do read the spacecraft loud and clear here in Houston. we are in the process at this time of switching to some of the back up routes that we have and checking those out. we expect to have communications restored shortly. This problem first appeared at about 35 hours 10 minutes ground elapsed time. As I say we do expect to have it resolved shortly. We will continue to stand by and monitor and we will come back up after we have reestablished communications.

END OF TAPE